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FINAL REPORT
SEPTEMBER 1994

Survey of Emissions from Solvent Use

Volume I: Aerosol Paints
Volume II: Architectural Coatings

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

AIR RESOURCES BOARD
Research Division

Survey of Emissions from Solvent Use

Volume I: Aerosol Paints
Volume II: Architectural Coatings

Final Report

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Contract No. A132-086

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Volume I: Aerosol Paints

The statements and conclusions in this report are those of the contractor and not necessarily those of the California Air Resources Board. The mention of commercial products, their sources, or their use in connection with material reported herein is not to be construed as actual or implied endorsement of such products.

ACKNOWLEDGEMENTS

The Battelle Principal Investigator for this task was Dr. John Orban. Subtask leaders were Dr. Philip Sticksel, data review and company contact; Ms. Tamara Collins, data management and documentation; and Mr. Nick Sasso, database system programming. Other contributors included Ms. Kim Hern and Ms. Christine O'Donnell, data entry and validation; and Mr. Steve Wall, database system support. Technical typing was performed by Ms. Mary Kayser and Ms. Yvonne Abernathy.

Technical direction at ARB was provided by Mr. Paul Milkey and Ms. Peggy Taricco of ARB's Stationary Source Division. The Contract Manager was Mr. Ralph Propper of ARB's Research Division.

This report was submitted in fulfillment of ARB Contract A132-086: Survey of Emissions from Solvent Use (Volume I: Aerosol Paints -- Volume II: Architectural Coatings) by Battelle Memorial Institute under sponsorship of the California Air Resources Board. Work was completed as of September 13, 1994.

ABSTRACT

The California Air Resources Board (ARB) is required under section 41712 of the California Health and Safety Code to develop regulations controlling the emissions of volatile organic compounds (VOC) from aerosol coating products packaged in disposable cans and dispensed by means of a propellant. In February, 1993, the ARB mailed survey questionnaires to companies that potentially sold aerosol coating products in California. Information requested from the companies included coating category, type of use, and product composition (weight percent of VOCs, solids, water, and other components). Fifty-eight companies reported sales of 17.6 million pounds of aerosol paints in California during 1992. Approximately 91% of the aerosol paints sold in California are solvent-based and 9% are water-based. Products were classified into seven "general" and 27 "specialty" coating categories. Fifty-five percent of the products were classified as non-flat paints, 27% were classified in six other general categories, and 18% were classified as specialty coatings. Total emissions were estimated to be 13.5 million pounds of VOCs. The sales weighted average VOC content of the products in the survey was 77% by weight. The ARB will use the results of the survey to better understand the aerosol paint marketplace and to evaluate the emissions and cost impacts of proposed standards.

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INTRODUCTION

The California Air Resources Board is required under section 41712 of the California Health and Safety Code to develop regulations controlling the emissions of volatile organic compounds (VOCs) from aerosol coating products. These regulations would cover coatings that are packaged in disposable cans and are dispensed from these cans by means of a propellant.

In order to estimate the amount of VOCs potentially entering the air from aerosol paint cans, the ARB conducted a survey of all manufacturers and marketers of aerosol coating products in the state. The ARB will use the data to better understand the aerosol paint marketplace and to evaluate the emissions and cost impacts of proposed standards.

MATERIALS AND METHODS

THE SURVEY

In February, 1993, the ARB mailed survey questionnaires to companies that potentially sold aerosol coating products in California during 1992. The initial mailing list was formed from the following sources of information:

1. National Paint and Coating Association
   1500 Rhode Island Ave., NW
   Washington, DC 20005-5597

2. Western Aerosol Information Bureau
   P.O. Box 1723
   Walnut, CA 91788-1723

3. 1992 Thomas Register (Sections: "Paints: Aerosol Touch-Up" and "Coatings: Aerosol")

4. Industry Supplied Mailing Lists

Of the 87 companies identified from these sources and contacted by mail, 61 (70%) returned survey questionnaires to ARB . All of the companies that were known at that time to manufacture or distribute aerosol paints in California completed a questionnaire. A few of the companies that returned questionnaires indicated that they do not sell aerosol paints in California.

Following the initial mailing, 27 small companies were added to the mailing list and sent surveys when they contacted the ARB for information about aerosol paint regulations, or were identified in the course of ARB's regulation development efforts. Seven of these companies returned completed questionnaires to ARB, in time to include them in the results of this report.

Of the 68 companies returning questionnaires to ARB by November 1, 1993, it was determined that 58 sell aerosol paints in California. The other 10 companies either stated that they do not sell aerosol paints in California or they are manufacturers whose products are distributed by other participating companies. In the latter case, product information from the manufacturer was combined with the company information provided by the distributor. The names of the participating companies with headquarters in California (based on reported mailing address) are listed in Table 1a. Participating companies from other U.S. states and Canada are listed in Table 1b. Companies that consider themselves to be small businesses are noted in Tables 1a and 1b.

Information requested from the companies includes company address, contact person, company size (small or large business), market classification (interstate, California statewide, California regional), and whether or not the company sells aerosol coatings in California. Product information requested includes coating category, type of use (home, industry, both), 1992 sales (lbs/yr), and product composition (weight percent of VOCs, solids, water, and other components). A copy of the survey questionnaire mailed to the companies is provided in Appendix A.

DATA PROCESSING

Battelle Memorial Institute, under contract with the ARB, processed the survey data. Battelle prepared a computer database, reviewed the data for accuracy and completeness, contacted representatives of participating companies to resolve problems, and prepared this report summarizing the results. Battelle also provided ARB with the database and computer programs to calculate emission reductions based on proposed standards.

Several steps were taken to ensure the accuracy and completeness of the data:

- Data were keyed twice into separate Paradox data files by two different keyers. The resulting files were compared electronically and differences were resolved using the original data forms.

- Data were sorted and printed for visual inspection to identify missing data and obvious errors in completing the questionnaires.

- Electronic data checks were performed to identify problems with the data. These checks included verifying that (1) The sum of percentages for VOCs, solids, water, and "other" components summed to 100%; (2) The reported amounts of VOC did not include methylene chloride (MC), 1,1,1-trichloroethane (TCA), and perchloroethylene (Perc) which were to be reported separately; (3) The amount of propellants was less than the amount of VOC; and (4) Selected data fields were completed.

- Problems identified through visual inspection and electronic data checks were resolved by contacting company representatives.

Twenty-one companies were contacted by telephone to resolve data management issues. Most questions were easily answered by correcting illegible data, recalculating the percentages of the components of the aerosol paints, or entering the information in the format that was requested by the survey form. Many errors were caused by the respondent's failure to understand the question. In several instances data were missing on the survey form because one firm (the distributor) was supplying the sales information while another firm (the manufacturer) was supplying the technical data. Both sets of data had been submitted in response to the survey, so the solution to the problem was to merge the two sets of data. The data were placed in the file under the distributor's name.

A common mistake was that the respondent assumed that MC, TCA, and PERC should be listed as VOC's instead of "other" when the percentages of components was totaled. Also, errors were occasionally made by the respondents when they used their composition formulas to calculate the percentages by weight of VOC, water, and "other" in their product.

The telephone conversations revealed that many companies had made special formulations of their product to meet the Bay Area requirements. To emphasize this action they listed the sales of this product under Bay Area only, but did not report the sales under the heading of California Sales. The correction was easily made once the respondent knew what was wanted.

One company reported sales per year instead of pound per year. Since the contact person was a replacement for the person who had originally filled out the survey form, we requested that he provide us an estimate of the pounds per year sold based on the provided dollar amount per year sold figure divided by the estimated cost of the individual product, multiplied by the number of pounds in each product. They provided this information.

Battelle provided ARB with detailed documentation of the data processing activities, database structure, and the database software for calculating emission reductions. ARB will also use the software to update the database and perform additional analyses as needed.

The data presented in this report were provided to the ARB by participating companies who manufacture or distribute aerosol paints in California. In processing the data, Battelle made every effort to minimize errors in data entry and took several steps to identify inconsistencies in the data. Battelle attempted to resolve problems through discussions with the ARB and company representatives. The validity of results presented in this report depends on the accuracy of the data which were provided by paint manufacturers and distributors.

RESULTS

TOTAL SALES AND ESTIMATED VOC EMISSIONS

The 17.6 million pounds of aerosol paint products reported sold in California during 1992 contain an estimated 13.5 million pounds of VOCs (77% sales weighted average VOC content). Thirteen of the 58 companies reporting California sales are located in California, 13 in Ohio, and 8 in Illinois. The remaining 24 companies are located in 15 other U.S. states and Canada. However, as shown in Figure 1, over 61 percent of the total sales come from Ohio-based companies. Companies in California and Illinois account for 29 percent of sales, and companies from the other states and Canada account for the remaining 10 percent of sales. The 33 companies that classified themselves as small businesses accounted for 5.8 million pounds, or approximately one-third of the statewide sales in 1992.

The participating companies reported information on 1,093 separate aerosol paint products. As shown in Table 2, nearly two-thirds of the companies reported sales of fewer than 10 products.

SALES AND ESTIMATED EMISSIONS BY COATING CATEGORY

Products were classified into seven "general" and 27 "specialty" coating categories. Figure 2 shows the percent of sales in each of the seven general categories and in the combined specialty categories. Nearly 55% of the aerosol paints sold in California are classified as non-flat paints and 27% were classified in six other general categories. Approximately 18% of the paints sold were classified as specialty coatings. Figure 3 describes the distribution of VOC emissions (as percent of total estimated emissions) among the various coating categories.

Table 3 contains a summary of the results from the 1992 aerosol paint survey. No sales were reported in three of the specialty categories (Corrosion Resistant Brass/Bronze/Copper Coatings, Photographic Emulsion Coatings, and Floral Sprays).

However, ARB staff have subsequently identified manufacturers of these products and expect to receive survey data for these categories in the future. Thirteen of the specialty coating categories were consolidated into the "other specialty coatings" category because the products were provided by fewer than four companies. Release of such data for individual categories could be considered proprietary by the manufacturers.

Table 3 summarizes the sales and composition of products sold within 19 coating type categories. For example, in 1992, over 634,000 pounds of clear coatings were sold in California. The sales were divided among 102 products from 27 different companies. Reported VOC levels among the clear coatings ranged from 50.5% to 96.7%, with a sales weighted average of 84.7%. Estimated annual emissions include 537,593 pounds of VOCs, 2,948 pounds of methylene chloride, and 455 pounds of 1,1,1-Trichloroethane. Sales weighted average percentages of solids, water, other non-VOC components, and propellants are also provided.

PRODUCTS CONTAINING METHYLENE CHLORIDE OR 1,1,1-TRICHLOROETHANE

Among all products sold in California, 2.6% contain methylene chloride (MC) and 3.6% contain 1,1,1-trichloroethane (TCA). Estimated annual emissions of MC and TCA were 145,926 pounds and 191,239 pounds, respectively. Combined, these represent 2.4% of the estimated total (VOC+MC+TCA) emissions from aerosol paint products. TCA is being phased out by the U.S. EPA and will no longer be produced for use in aerosol paints or other nonessential products after January 1, 1996. No companies reported sales of aerosol products containing perchloroethylene.

WATER-BASED AND SOLVENT-BASED PRODUCTS

Additional information on water-based and solvent-based products is provided in Table 4. Approximately 1.6 million pounds of water-based products were sold in California in 1992. This represents 9.3% of the total aerosol paint sales across all coating

types. In general, the water-based products represent a small portion of sales in most coating categories. Exceptions include ground traffic marking coatings and spatter coatings. Water-based products are most common in ground traffic marking coatings (22 of 38 products), non-flat plants (16 of 194 products), flat paints (8 of 79 products), and spatter coatings (4 of 7 products).

PRODUCTS SOLD EXCLUSIVELY IN THE BAAQMD

Regulation 8, Rule 49, adopted in 1990 in the Bay Area Air Quality Management District (BAAQMD) to limit emissions of organic compounds from the use of hand-held aerosol paint products, has resulted in several products being offered exclusively in the BAAQMD. A copy of the rule is provided in Appendix B. Manufacturers reported that these products were sold only in the BAAQMD. Table 5 compares these products with those sold statewide (including the BAAQMD). There are 44 products sold exclusively in the BAAQMD, representing approximately five percent of the total California sales. However, some products that comply with the BAAQMD regulation are sold statewide or nationwide, including the Bay Area, and as such are not classified as "products sold exclusively in the BAAQMD." The exclusive products are more likely to be water based (15.5% versus 9.1% for statewide sales), especially in the clear coating, flat paint, and non-flat paint categories.

Table 1a. California Companies Participating in the 1992 Aerosol Paint Survey

BAF Industries
Behr Process Corporation
Deft, Inc.*
Delta Technical Coatings
Duncan Enterprises*
Dunn-Edwards Corporation
Flecto Company, Inc.*
Kop-Coat, Inc.*
Leggett & Platt, Inc.
Life Paint Company*
Mann Brothers/Division of Surface Protection, Inc.
Products/Techniques, Inc.*
Zynolyte Products Company

* Company reported as a small business.

Table 1b. Non California Companies Participating in the 1992 Aerosol Paint Survey

3M	Mohawk Finishing Products/Floquil
ACE Products-Private Label	Plasti-Kote Company, Inc.*
Aerosol Maintenance Products*	PPG Industries, Inc.
Aervoe-Pacific Company*	Raabe Corporation*
Barrier International Corporation*	Revere Products*
Chase Products Company*	Rudd Company, Inc.*
Coverite/Division of US Hobby*	Rust-Oleum Corporation
DAP, Inc.*	Seymour of Sycamore
Drummond American Corporation	Sherwin Williams-Private Label
Dynatron/Bondo Corporation	Sprayon, Industrial
Floquil-Pollys Color Corp/Mohaw*	Star Finishing Products, Inc.*
Forrest Paint Company*	State Chemical Mfg. Company
Imperial, Inc.*	Taylor Made Products*
Jacobsen Division of Textron, Inc.	Testor Corporation/Pactra, Inc.*
Johnstone Supply	The Valspar Corporation
K-G Packaging/Division CCL	Thompson Formby, Inc.*
K-MART-Private Label	Tru-Test Manufacturing Company
Klinger Paint Company, Inc.*	United Coatings, Inc.
Krylon/Dupli-Color Prod	William Zinsser & Company, Inc.
Kurfees Coatings*	Xim Products, Inc.*
Loctite Corporation	Zehrung Corporation*
Marson Corporation*	ZRC Products Company*
Minwax Company, Inc.	

* Company reported as a small business.

Table 2. Number of Products Reported by Participating Companies

Number of Products	Number of Companies	Percent of Companies
1-9	37	64%
10-19	8	14%
20-99	10	17%
100-199	2	3%
200-299	1	2%
Total	58	100%

Table 3. Summary of Results from the 1992 Aerosol Paint Survey

Coating Type	No. of Companies	No. of Products	Total Sales (lbs/yr)	Min VOC (%)	Max VOC (%)	SW Avg VOC[a] (%)	Estimated Total VOC Emissions (lbs/yr)	MC[b] (lbs/yr)	TCA[c] (lbs/yr)	SW Avg Solids (%)	SW Avg Water (%)	SW Avg Other[d] (%)	SW Avg Propellent (%)
Clear Coatings	27	102	634,696	50.5	96.7	84.7	537,593	2,948	455	13.4	1.4	0.5	25.5
Flat Paint Products	18	79	1,604,160	42.4	95.2	75.7	1,213,885	11,323	19,742	21.2	1.2	1.9	24.6
Fluorescent	14	19	258,685	54.0	84.0	70.3	181,959	0	7,557	20.2	6.5	2.9	29.9
Ground Traffic Markings	14	38	634,051	44.0	76.0	58.2	368,809	1,633	0	30.0	11.6	0.3	22.3
Metallic Coatings	17	85	797,788	46.0	95.0	83.3	664,491	6,669	0	15.9	--	0.8	26.0
Non-Flat Paint Products	29	194	9,600,894	43.7	95.0	76.8	7,375,896	86,802	132,769	18.3	2.6	2.3	26.5
Primer	23	84	807,138	39.0	96.0	71.8	579,416	9,294	0	26.9	0.2	1.2	25.0
Vinyl/Fabric/Polycarbonate	6	33	57,042	66.5	95.5	91.6	52,231	0	0	8.4	--	0.0	22.6
Engine Enamel	6	8	178,002	50.5	89.5	78.6	139,931	0	6,982	17.5	--	3.9	25.0
Industrial	9	32	57,044	62.5	93.0	82.3	46,957	0	0	17.6	0.0	0.0	24.1
Auto Body Primer	8	28	824,067	52.0	97.7	76.8	632,662	7,647	0	22.3	0.0	0.9	22.0
Auto Bumper and Trim	5	11	89,583	62.0	98.1	72.2	64,697	5,082	2,345	19.5	--	8.3	26.1
Glass Coating	4	5	6,778	69.0	95.0	84.6	5,734	0	500	8.0	--	7.4	31.9
High Temperature Coating	14	29	383,326	59.9	93.8	81.8	313,370	0	12,812	14.9	--	3.3	24.9
H/M/C[e] Enamel	6	167	131,539	58.0	90.0	77.4	101,820	0	1,051	21.7	--	0.9	25.6
H/M/C Lacquer	6	26	19,171	63.0	94.2	84.9	16,270	0	154	14.3	--	0.8	20.5
H/M/C Clear, Metallic	4	63	461,587	74.2	96.4	88.7	409,530	10,516	1	9.0	--	2.3	26.9
Spatter Coating	5	6	217,348	32.0	63.0	58.8	127,868	0	0	17.8	23.4	0.0	20.6
Other Specialty Coatings[f]	22	84	798,064	44.0	97.0	77.7	620,248	4,012	6,870	19.0	1.9	1.4	21.4
Grand Total		1,093	17,560,961			76.6	13,453,367	145,926	191,239	19.0	2.5	1.9	25.5

(a) Sales weighted average percent (by weight) of volatile organic compounds (VOC).
(b) MC = Methylene Chloride.
(c) TCA = 1,1,1-Trichloroethane.
(d) Other = Ingredients other than VOCs, solids, and water.
(e) H/M/C = Hobby/Model/Craft.
(f) Other speciality coatings include art varnish, corrosion resistant brass/bronze/copper coatings, marine spar finish, clear shellac, pigmented shellac, webbing/veiling coating, wood stain, workable art fixative, automotive finish, aviation propeller coating, aviation zinc primer, floral spray, slip resistant epoxy, weld-through primer, wood touch-up/repair/restoration coating.

1992 ARB Aerosol Paint Survey

Table 4. Total Sales, Estimated VOC Emissions, and Percent Solids for Water-Based and Solvent-Based Coatings

Coating Type	Total (lbs/yr)	Water-Based				Solvent-Based			
		Sales (lbs/yr)	Estimated VOC Emissions (lbs/yr)	SW Avg Pct. VOC[a] (%)	SW Avg Pct. Solids (%)	Sales (lbs/yr)	Estimated VOC Emissions (lbs/yr)	SW Avg Pct. VOC (%)	SW Avg Pct. Solids (%)
Clear Coatings	634,696	35,234	23,204	65.9	9.4	599,462	514,389	85.8	13.6
Flat Paint Products	1,604,160	74,909	39,932	53.3	21.4	1,529,251	1,173,953	76.8	21.2
Fluorescent	258,685	56,257	30,387	54.0	16.0	202,428	151,572	74.9	21.4
Ground Traffic Marking Coatings	634,051	305,228	161,950	53.1	22.9	328,823	206,859	62.9	36.6
Metallic Coatings	797,788	0	--	--	--	797,788	664,491	83.3	15.9
Non-Flat Paint Products	9,600,894	887,835	464,211	52.3	19.4	8,713,059	6,911,684	79.3	18.2
Primer	807,138	7,726	5,252	68.0	14.8	799,412	574,164	71.8	27.0
Vinyl/Fabric/Polycarbonate	57,042	0	--	--	--	57,042	52,231	91.6	8.4
Engine Enamel	178,002	0	--	--	--	178,002	139,931	78.6	17.5
Industrial	57,044	17,290	14,452	83.6	16.3	39,754	32,505	81.8	18.2
Auto Body Primer	824,067	54	35	65.0	18.0	824,013	632,627	76.8	22.3
Automotive Bumper and Trim Product	89,583	0	--	--	--	89,583	64,697	72.2	19.5
Glass Coating	6,778	0	--	--	--	6,778	5,734	84.6	8.0
High Temperature Coating	383,326	0	--	--	--	383,326	313,370	81.8	14.9
H/M/C[b] Enamel	131,539	0	--	--	--	131,539	101,820	77.4	21.7
H/M/C Lacquer	19,171	0	--	--	--	19,171	16,270	84.9	14.3
H/M/C Clear, Metallic	461,587	0	--	--	--	461,587	409,530	88.7	9.0
Spatter Coating	217,348	215,650	127,057	58.9	17.5	1,698	812	47.8	52.2
Other Specialty Coatings[c]	798,064	48,450	24,054	49.6	18.3	749,614	596,194	79.5	19.0
Total/Average	17,560,961	1,648,633	890,533	54.0	19.5	15,912,328	12,562,834	79.0	18.9

(a) Sales weighted average percent (by weight) of volatile organic compounds (VOC).

(b) H/M/C = Hobby/Model/Craft.

(c) Other speciality coatings include art varnish, corrosion resistant brass/bronze/copper coatings, marine spar finish, clear shellac, pigmented shellac, webbing/veiling coating, wood stain, workable art fixative, automotive finish, aviation propeller coating, aviation zinc primer, floral spray, slip resistant epoxy, weld-through primer, wood touch-up/repair/restoration coating.

Table 5. Comparison of Products Sold Statewide with Products Sold Exclusively in the BAAQMD

Coating Type	Statewide Sales			Exclusive BAAQMD[a] Sales		
	Number of Products	Coating Sales (lbs/yr)	Sales of Water-Based Products (%)[b]	Number of Products[c]	Coating Sales (lbs/yr)	Sales of Water-Based Products(%)[b]
Clear Coatings	98	572,945	5.2	4	(d)	(d)
Flat Paints	73	1,438,204	3.1	6	165,956	18.1
Fluorescent Coatings	19	258,685	21.7	0	--	--
Ground Traffic Marking	38	634,051	48.1	0	--	--
Metallic Coatings	79	777,738	0	6	(d)	(d)
Non-Flat Paints	182	9,158,507	8.6	12	442,387	22.0
Primers	77	758,678	1.0	7	48,460	0.6
Specialty Coatings[e]	483	3,107,323	9.1	9	116,227	0.1
Total/Average	1,049	16,706,130	9.1	44	854,831	15.5

(a) BAAQMD = Bay Area Air Quality Management District.
(b) Percent of total category sales that contain water.
(c) Number of products sold exclusively in the BAAQMD. Complying products in each category that are available statewide or nationwide are also sold in the Bay Area.
(d) Data considered proprietary by some manufacturers.
(e) Specialty coatings include vinyl/fabric/polycarbonate coating, engine enamel coating, industrial coating, auto body primer, automotive bumper and trim coating, glass coating, high temperature coating, hobby/model/craft enamel coating, hobby/model/craft lacquer coating, hobby/model/craft clear metallic coating, spatter coating, art varnish, corrosion resistant brass/bronze/copper coatings, marine spar finish, clear shellac, pigmented shellac, webbing/veiling coating, wood stain, workable art fixative, automotive finish, aviation propeller coating, aviation zinc primer, floral spray, slip resistant epoxy, weld-through primer, wood touch-up/repair/restoration coating.

California Sales of Aerosol Paints by Company Headquarter Location*

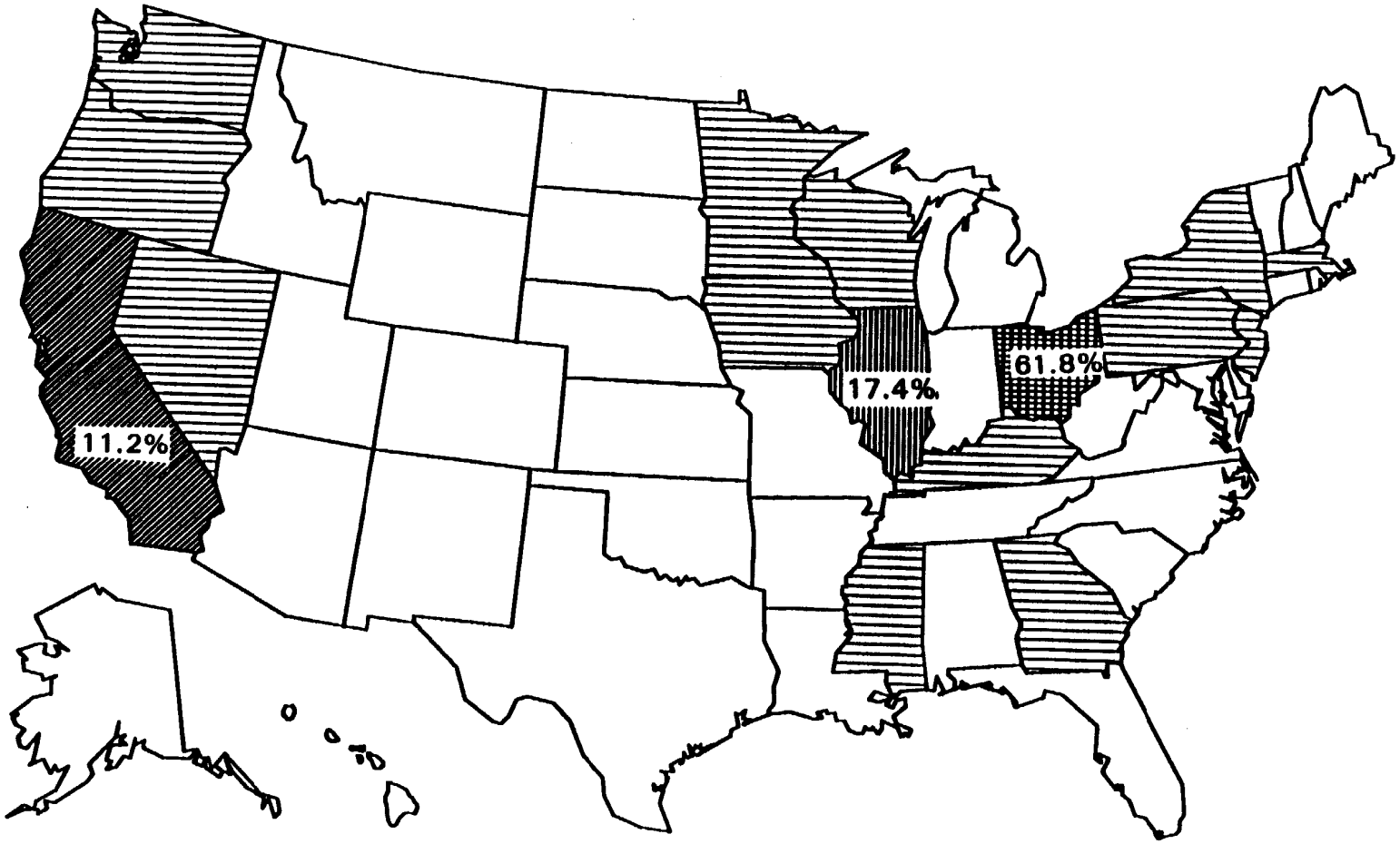

Figure 1.

* Shaded states other than California, Ohio, and Illinois account for less than ten percent of aerosol paints sold in California.

1992 ARB Aerosol Paint Survey

Percentage of California Sales of Aerosol Paints Contributed by Each Coating Category

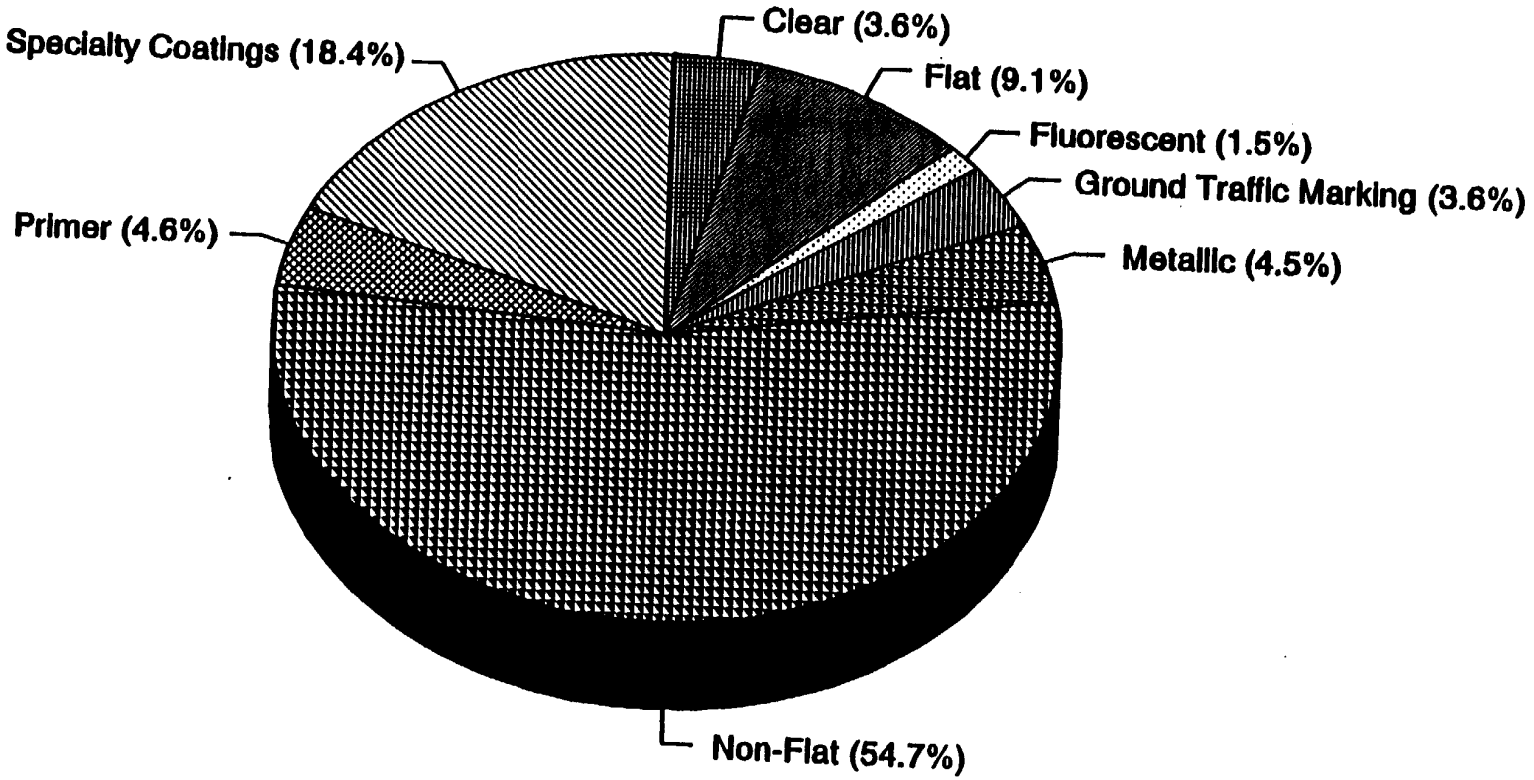

Figure 2.

1992 ARB Aerosol Paint Survey

Percentage of Estimated Total VOCs from California Sales of Aerosol Paints Contributed by Each Coating Category

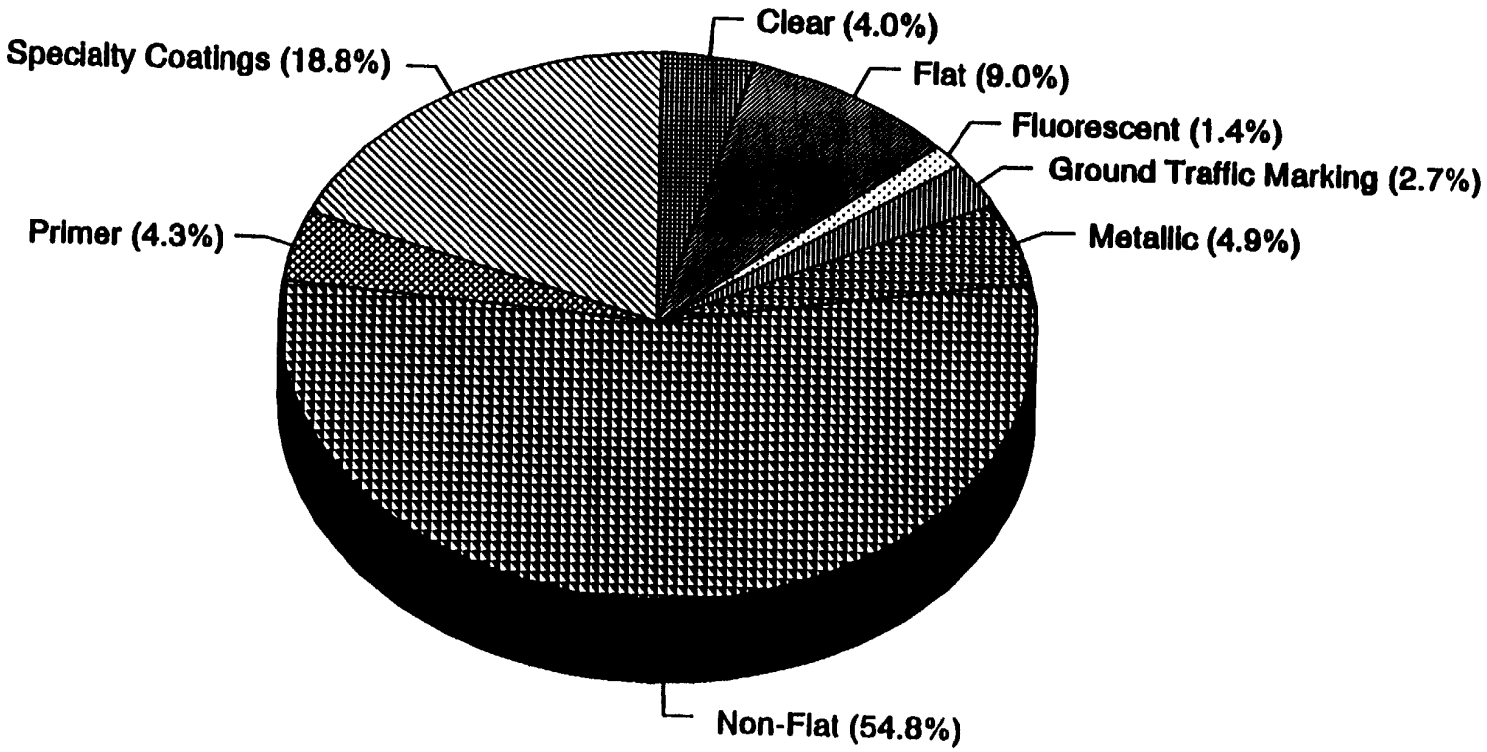

Figure 3.

GLOSSARY OF ABBREVIATIONS

ARB	=	Air Resources Board
BAAQMD	=	Bay Area Air Quality Management District
MC	=	Methylene Chloride
TCA	=	Trichloroethane
VOCs	=	Volatile Organic Compounds

APPENDIX A

SURVEY QUESTIONNAIRE

E OF CALIFORNIA
RESOURCES BOARD
L STREET
BOX 2815
MENTO, CA 95812

PETE WILSON, Governor

February 25, 1993

Dear Sir or Madam:

The Air Resources Board (ARB) is conducting a survey of hand-held aerosol coating products sold in California. The information requested in the survey will help the ARB staff estimate the volatile organic compound (VOC) emissions from aerosol coating products and develop a regulation to limit the emissions of VOCs from aerosol coating products. The enclosed survey needs to be completed by March 31, 1993.

This request for information is made pursuant to sections 39607, 39701, and 41511 of the California Health and Safety Code, and Title 17, California Code of Regulations, section 91100. These sections authorize the ARB to require the submission of information needed by the ARB to estimate atmospheric emissions and to carry out its other statutory responsibilities. The information you submit and note as confidential shall be protected in accordance with Title 17, California Code of Regulations , sections 91000 to 91022, and the California Public Records Act (Government Code section 6250 et seq.). Please complete and sign the Confidentiality Information Submittal Form if you are designating any information contained in your survey as confidential.

The survey requests data on the 1992 sales of aerosol coating products and their VOC content. If you do not know the VOC content or other formulation data for a product on which you are reporting, and are unable to obtain such information, you must identify the company who does know such information and request that the information be forwarded to the ARB. You are responsible for completing this survey form for any aerosol coating product for which your company is the sole company listed on the product label. If the label lists two companies, you are responsible for only those products that are "manufactured for" or "distributed by" your company.

In order to process the survey information more rapidly, the ARB has contracted with Battelle, a firm with experience in survey design and analysis. Battelle has entered into a confidentiality agreement with the ARB to handle all survey information according to the applicable sections of the California Code of Regulations and the California Public Records Act. Therefore, you may be contacted by an employee of Battelle if a question arises pertaining to the data provided in the survey.

Please complete the attached survey forms according to the instructions provided and submit to the ARB by March 31, 1993 at the following address:

California Air Resources Board
P.O. Box 2815
Sacramento, CA 95812
Attention: Solvents Control Section/Aerosol Paint Survey

I would like to thank you in advance for your efforts in completing this survey. If you have any specific questions concerning this survey, please contact one of the contacts listed on page 1 of the survey packet. If you have general questions about the regulatory or survey process, please call Peggy Vanicek, Manager, Solvents Control Section, Criteria Pollutants Branch, Stationary Source Division, at (916) 322-8283.

Sincerely,

Dean C. Simeroth, Chief
Criteria Pollutants Branch
Stationary Source Division

Enclosure

AEROSOL PAINT SURVEY

CALIFORNIA 1992 SALES

CALIFORNIA ENVIRONMENTAL PROTECTION AGENCY

AIR RESOURCES BOARD

CONDUCTED BY ARB - SPRING 1993

California Air Resources Board - Aerosol Coatings Survey

Survey Packet Contents

If you have any questions, please call:

Paul Milkey (916) 327-1517
Peter Liu (916) 327-1516

INSTRUCTIONS FOR COMPLETING THE SURVEY FORM

Please complete the enclosed survey forms. Complete Form I by answering the questions in the form. Complete Form II for all aerosol coating products by following the instructions provided below. Please photocopy Form II if additional copies are necessary. In reporting products for the survey, report each coating product in a coating category as a separate item. You many group coatings together within the same coating category only when the following conditions are met:

(1) the coatings do not vary in VOC content by more than two percent (by weight); and the coatings are based on the same resin type and carrier type (i.e. solvent-borne or water-borne); or

(2) the coatings are color varieties of the same coating product (even if the coatings vary by more than 2% VOC).

In reporting grouped coatings as one entry, the VOC content and other formulation data reported for the entry shall be the sales weighted average value (see below for sales weighted average calculation). Also, for grouped coatings, the range in VOC content should be listed under "Comments" on the survey form.

Sales Weighted Average Calculation

The Sales Weighted Average (SWA) is an average value for grouped coatings calculated by weighting the individual values by their sales. For this survey, the SWA should be used to report grouped coatings under entries (7) through (14) on survey Form II.

$$SWA = \frac{(Value_1 \times Sales_1 + Value_2 \times Sales_2 + \ldots Value_n \times Sales_n}{Sales_1 + Sales_2 \ldots Sales_n}$$

Where: Value (1,2...n) = Coating characteristic values (e.g., VOC content) for products 1,2,...n.

Sales (1,2,...n) = Sales (lbs/yr) for products 1,2,...n.

1) Item Number - Number each coating entry into the survey form starting from 1.

(2) Product Name - List the product name of each product exactly as it appears on the label of your product. Grouped products within the same coating category, may be listed as "various names", with sales data reported as an aggregate. If there are multiple product names, please list under the space provided for "Comments" if possible.

(3) Use Code (H,I,B) - Identify whether the product is used for household (H), industrial (I), or both (B) in the column provided.

(4) Coating Code - Enter the code from the list below which best describes the coating product (see pages 5-9 for definitions of the categories below). If none of the codes apply, enter "other" and explain under the "Comments" section at the bottom of the survey Form II. Enter data only for products that are designed to apply a permanent coating.

Code	Coating
General Coatings	
01	Clear Coatings
02	Flat Paint Products
03	Fluorescent
04	Ground Traffic Marking Coatings
05	Metallic Coatings
06	Non-Flat Paint Products
07	Primer
Specialty Coatings-Clear and Tinted Coatings	
08	Art Varnish
09	Corrosion Resistant Brass/Bronze/Copper Coatings
10	Marine Spar Varnish
11	Photographic Emulsion Coating
	Shellac Sealer
12	Clear
13	Pigmented
14	Vinyl/Fabric/Polycarbonate
15	Webbing/Veiling Coating
16	Wood Stain
17	Workable Art Fixative
Specialty Coatings-Exact Match Finish	
18	Engine Enamel

19	Automotive
20	Industrial

Specialty Coatings-Miscellaneous Coatings

21	Auto Body Primer
22	Automotive Bumper and Trim Products
23	Aviation Propeller Coatings
24	Aviation Zinc Primer
25	Floral Spray
26	Glass Coating
27	High Temperature Coating

Hobby/Model/Craft Coatings

28	Enamel
29	Lacquer
30	Clear, Metallic
31	Spatter Coating
32	Slip-Resistant Epoxy Coating
33	Weld-Through Primer
34	Wood Touch-up/Repair/Restoration

(5) 1992 California Sales - Enter your best estimate of the California sales (including the Bay Area sales) of the coating (in pounds per year) during the calendar year 1992. If such data are not available, enter the sales from the twelve month period closest to 1992. Include all coatings that your company sold in California or sold to another party for sale in California during the calendar period of reporting.

(6) Bay Area Sales Only - Enter a check in this column, if the product is sold only in the Bay Area Air Quality Management District during the calendar period of reporting.

(7) Percent By Weight - VOC - Enter the percent by weight of volatile organic compound (VOC) content, as defined under "Definitions".

(8) Percent By Weight - Solid - Enter the percent by weight of solids, including pigments, resins, fillers, and other ingredients that do not evaporate after the coating is applied.

(9) Percent By Weight - Water - Enter the percent by weight of water in the product.

(10) Percent By Weight - Other - Enter the percent by weight of all other ingredients that do not fall under the definition of VOC, solid, or water (if any). For example, halogenated

solvents such as methylene chloride, 1,1,1-trichloroethane (methyl chloroform), and perchloroethane. Note that columns (7) through (10) should add up to 100%.

(11) Percent By Weight - MC - Enter the percent by weight of methylene chloride in the product.

(12) Percent By Weight - TCE - Enter the percent by weight of 1,1,1-trichloroethane (methyl chloroform) in the product.

(13) Percent By Weight - Perc - Enter the percent by weight of perchloroethylene in the product.

(14) Percent By Weight - Propellant - Enter the percent by weight of propellants in the product (for example, isobutane and propane).

DEFINITIONS

Aerosol: A suspension of solid or liquid particles in a gas.

Aerosol Paint Product: A mixture of pigments, resins, liquid solvents and gaseous propellants, packaged in a disposable can for hand-held application.

Art Varnish: A coating labelled exclusively as such which provides a protective sealant for oil paints or other closely related art uses.

Auto Body Primer: A heavily pigmented automotive primer or primer surfacer coating labelled exclusively as such and applied directly to an uncoated vehicle body substrate or on top of a precoat for purposes of corrosion resistance, building a repair area to a condition in which it, after drying, can be sanded to a smooth surface.

Automotive Bumper and Trim Products: Coatings formulated and labelled exclusively as such which are used to repair and refinish automotive bumpers and plastic trim parts including adhesion promoters and chip sealants.

Aviation Propeller Coating: An epoxy coating formulated and labelled exclusively as such which provides abrasion resistance and corrosion protection for aircraft propellers.

Aviation Zinc Primer: Zinc chromate or zinc oxide coatings formulated to military specification MIL-P-8989 and labelled exclusively as such.

Clear Coating: A coating which is colorless, containing binders but no pigment, and which is formulated to form a transparent or translucent solid film.

Corrosion Resistant Brass/Bronze/Copper Coating: A clear coating formulated and labelled exclusively as such to prevent tarnish and corrosion of brass, bronze, and copper surfaces.

Enamel: A coating which cures by chemical cross-linking of its base resin. Enamels can be readily distinguished from lacquers because enamels are not resoluble in their original solvent.

Exact Match Finish, Automotive: A topcoat labelled exclusively as such, which is formulated to exactly match the color of the original, factory-applied automotive finish coating during touch-up or minor repair operations. The cans shall be labelled with the OEM part number. Can contents shall not exceed six ounces by weight if offered for retail sale.

Exact Match Finish, Engine Paint: A coating, labelled exclusively as such, applied to the exterior surface of motor vehicle engine blocks or components attached to a motor vehicle engine. The cans shall be labelled with the Original Equipment Manufacturer's (OEM) part number.

Exact Match Finish, Industrial: A coating which is formulated to exactly match the color of an original, factory-applied industrial coating. The cans shall be labelled with the manufacturer's OEM part number. This category applies primarily to touch-up of manufactured products prior to shipment or during initial installation: retail sales will be allowed through authorized OEM dealers only.

Flat Paint Products: A coating which, when fully dry, has a gloss of 5 or less on a 60 ° meter.

Floral Spray: A coating labelled exclusively as such, which is sprayed on fresh flowers for the purpose of preserving and protecting their appearance.

Fluorescent Coating: A coating labelled as such which converts absorbed incident light energy into emitted light of a different hue.

Glass Coating: A coating labelled exclusively as such, which is applied to glass to tint or darken the color of the glass while retaining transparency.

Ground Traffic/Marking Coating: A coating used to delineate vehicular or pedestrian traffic flow in a manufacturing facility or on a public highway, or to mark or define locations used by public utilities (e.g. gas, telephone, electric).

Hobby/Model/Craft Coating: A coating primarily for hobby applications. Can contents shall not exceed six ounces by weight.

High Temperature Coating: A coating labelled exclusively as such, which is formulated for and applied to substances which will, in normal use, be subjected to temperatures in excess of 400 ° F.

Lacquer: A film-forming material dissolved in organic solvent, which dries primarily by solvent evaporation, and hence is resoluble in its original solvent.

Marine Spar Varnish: A coating labelled exclusively as such which provides a protective sealant for marine wood products.

Metallic Coating: A topcoat labelled as such and containing metallic particles which impart a metallic appearance when dry.

Multi-Component Kits: Aerosol spray paint systems which require the application of more than one component (e.g., foundation coat and top coat), where both components are sold together in one package and neither is sold separately.

Non-Flat Paint Products: A coating which, when fully dry, has a gloss of greater than 15 on an 85° meter or greater than 5 on an 60 ° meter.

Paint: A mixture of pigments, resins, and liquid solvents which can be applied to a surface to form a thin and closely adherent coating. For the purposes of this regulation, this definition shall include, but shall not be limited to, clear coatings, primers, metallic coatings, and wood stains.

Photographic Emulsion Coating: A coating formulated and labelled exclusively as such, applied to finished photographs to allow corrective retouching or protection of the image.

Primer: A coating formulated and labelled as such to be applied to a surface to provide a bond between that surface and subsequent coats.

Propellant: A liquified or compressed gas which expels the contents of a container when the pressure is released.

Retail Sales: The sale of goods directly to a non-commercial consumer. For the purposes of this survey, sales to jobbers and industrial end-users shall not be deemed retail sales.

Shellac Sealer: A clear or pigmented coating formulated solely with the resinous secretion of the lac beetle (Laccifer lecca), thinned with alcohol, and formulated to dry by evaporation without a chemical reaction.

Slip-Resistant Epoxy Coating: An epoxy ester coating labelled exclusively as such which is formulated with synthetic grit, and used as a safety coating.

Solids: The non-volatile portion of an aerosol paint product, consisting of the film-forming ingredients (pigments and resins).

Spatter Coating: A coating wherein spots, globules, or spatters of individual or contrasting colors appear on or within the surface of a contrasting or similar background.

Vinyl/Fabric/Polycarbonate: A coating labelled exclusively as such, which is used exclusively to coat vinyl, fabric, or polycarbonate substrates.

Volatile Organic Compounds (VOC): Volatile organic compound means any compound containing at least one atom of carbon, except methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, ammonium carbonate, 1,1,1-trichloroethane, methylene chloride, trichlorofluoromethane (CFC-11), dichlorodifluoromethane (CFC-12), chlorodifluoromethane (HCFC-22), trifluoromethane (HFC-23), 1,1,1-trichloro-2,2,2-trifluoroethane (CFC-113), 1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114), chloropentafluoroethane (CFC-115), 2,2-dichloro-1,1,1-trifluoroethane (HCFC-123), 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124), pentafluoroethane (HFC-125), 1,1,2,2-tetrafluoroethane (HFC-134), 1,1,1,2-tetrafluoroethane (HFC-134a), 1,1-dichloro-1-fluoroethane (HCFC-141b), 1-chloro-1,1-difluoroethane(HCFC-142b), 1,1,1-trifluoroethane(HFC-143a), 1,1-difluoroethane (HFC-152a), and the following four classes of perfluorocarbon (PFC) compounds:

(1) cyclic, branched, or linear, completely fluorinated alkanes,
(2) cyclic, branched, or linear, completely fluorinated ethers with no unsaturations,
(3) cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations, and
(4) saturated perfluorocarbons containing sulfur with sulfur bonds only to carbon and fluorine.

Vebbing/Veiling Coating: A coating labelled exclusively as such, which is formulated to give stranded or spider webbed appearance when applied.

Veld-Through Primer: A coating formulated and labelled exclusively as such which provides bridging or conducting effect to provide corrosion protection following welding.

Wood Stain: A coating which is formulated to change the color of a wood surface but not conceal the surface.

Wood Touch-Up/Repair/Restoration: A coating formulated and labelled exclusively as such which provides an exact color or sheen match on finished wood products.

Workable Art Fixative: A clear coating formulated and labelled exclusively as such which provides protection for pencil, charcoal, chalk, and pastel drawings, while providing a workable surface.

California Air Resources Board - Aerosol Coatings Survey

Example of Completed Survey Form

The following page is a completed survey Form II (page 11) for the hypothetical coatings

Coating Description

"Purfec-Shun" Gloss Enamel (Snowy White)
Sales: 50,000 lbs (1992 Calif.); 0 (Bay Area)
Content Information: 25% solids: 50% hydrocarbon solvents:
25% hydrocarbon propellants

"Purfec-Shun" Gloss Enamel (BBQ Black)
Sales: 50,000 lbs (1992 Calif.); 0 (Bay Area)
Content Information: 15% solids: 60% hydrocarbon solvents:
25% hydrocarbon propellants

"Krystal-Kleer" Clear Coating (flat)
Sales: 10,000 lbs (1992-Bay Area only)
Content Information: 15% solids: 30% water: 20% hydrocarbon solvents:
35% propellant (DME)

"Otto Magic" Automotive Sanding Primer (gray)
Sales: 25,000 lbs (1992 Calif.); 4,000 lbs (Bay Area)
Content Information: 20% solids: 30% methylene chloride:
20% hydrocarbon solvents: 30% hydrocarbon propellant

SAMPLE

CONFIDENTIAL? YES ____ NO ____

AEROSOL PAINT SURVEY - FORM II

Item # (1)	Product Name (2)	Use Code (H,I,B) (3)	Coating Code (4)	1992 Calif. Sales lbs/yr (5)	Bay Area Sales Only (6)	Percent By Weight * VOC (Incl. propellant) (7)	Solids (8)	Water (9)	Other (10)	Percent By Weight MC (11)	TCA (12)	Perc (13)	Propellant (14)
1	Purfec-Shun	B	6	100,000		80%	20%	0	0	0	0	0	25%
2	Krystal-Kleer	B	1	10,000		55%	15%	30%	0	0	0	0	35%
3	Otto-Magic	B	21	25,000		50%	20%	0	30%	30%	0	0	30%

* Columns (7) - (10) should add up to 100%.

(16) Comments: Reference each comment with its item number and column number. Continue on back if additional space is necessary.

Item 1, Column 2: Colors white and black lumped together. VOC range 75% - 85%.

SAMPLE

COMPANY CODE NUMBER _____ (LEAVE BLANK)

PLEASE PHOTOCOPY THIS FORM IF NECESSARY

PAGE ____ OF ____

THE FOLLOWING PAGES ARE THE ACTUAL SURVEY FORMS
THAT MUST BE COMPLETED:

FORM I

FORM II

CONFIDENTIAL INFORMATION SUBMITTAL FORM

California Air Resources Board - Aerosol Paint Survey

Form I

Company Code [ ] (leave blank)

Company Name: _____

Address: _____

Contact Person: _____

Phone: _____

Please answer the following questions:

1. Does your company manufacturer and/or distribute aerosol coatings for sale in California?

   [ ] Yes [ ] No

2. What is your company's marketing classification?

   [ ] Interstate [ ] Calif. Statewide [ ] Calif. Regional

3. Do you consider your company to be a small business?

   [ ] Yes [ ] No

4. If you answered no to question #1, do you wish to remain on the Air Resources Board's mailing list?

   [ ] Yes [ ] No

ARB/SSD/1993

AEROSOL PAINT SURVEY - FORM II

Item # (1)	Product Name (2)	Use Code (II,I,B) (3)	Coating Code (4)	1992 Calif. Sales lbs/yr (5)	Bay Area Sales Only (6)	Percent By Weight *				Percent By Weight			
						VOC (Incl. pro-pellant (7)	Solids (Incl. resins) (8)	Water (9)	Other (10)	MC (11)	TCA (12)	Perc (13)	Pro-pellant (14)

* Columns (7) - (10) should add up to 100%.

(16) Comments: Reference each comment with its item number and column number. Continue on back if additional space is necessary.

COMPANY CODE NUMBER _____ (LEAVE BLANK)

PLEASE PHOTOCOPY THIS FORM IF NECESSARY

PAGE ____ OF ____

CONFIDENTIAL INFORMATION SUBMITTAL FORM

[If you wish to designate any information contained in your survey data as confidential, please provide the data requested below and return with it your survey.]

In accordance with Title 17, California Code of Regulations (CCR), Section 91000 to 91022, and the California Public Records Act (Government Code Section 6250 et seq.), the information that a company provides to the Air Resources Board (ARB) may be released (1) to the public upon request, except trade secrets which are not emissions data or other information which is exempt from disclosure or the disclosure of which is prohibited by law, and (2) to the Federal Environmental Protection Agency (EPA), which protects trade secrets as provided in Section 114(c) of the Clean Air Act and amendments thereto (42 USC 7401 et seq.) and in federal regulation, and (3) to other public agencies provided that those agencies preserve the protections afforded information which is identified as a trade secret, or otherwise exempt from disclosure by law (Section 39660 (e)).

Trade secrets as defined in Government Code Section 6254.7 are not public records and therefore will not be released to the public. However, the California Public Records Act provides that air pollution emission data are always public records, even if the data comes within the definition of trade secrets. On the other hand, the information used to calculate information is a trade secret.

If any company believes that any of the information it may provide is a trade secret or otherwise exempt from disclosure under any other provision of law, it must identify the confidential information as such at the time of submission to the ARB and must provide the name, address, and telephone number of the individual to be consulted if the ARB receives a request for disclosure or seeks to disclose the data claimed to be confidential. The ARB may ask the company to provide documentation of its claim of trade secret or exemption at a later date. Data identified as confidential will not be disclosed unless the ARB determines, in accordance with the above referenced regulations, that the data do not qualify for a legal exemption from disclosure. The regulations establish substantial safeguards before any such disclosure.

In accordance with the provisions of Title 17, California Code of Regulations, Section 91000 to 91022, and the California Public Records Act (Government Code Sections 6250 et seq.),

Company Name: ______________________________ declares that all the information submitted in response to the California Air Resources Board's Aerosol Paint Survey is "trade secret" information, and request that it be protected as such from public disclosure. All inquiries pertaining to the confidentiality of this information should be directed to the following person:

Date: ______________

______________________________ (Signature)

______________________________ (Printed Name)

______________________________ (Title)

______________________________ (Telephone Number)

Mailing Address:

____

____

____

____

APPENDIX B

BAAQMD REGULATION 8, RULE 49

REGULATION 8
ORGANIC COMPOUNDS
RULE 49
AEROSOL PAINT PRODUCTS

INDEX

REGULATION 8
ORGANIC COMPOUNDS
RULE 49
AEROSOL PAINT PRODUCTS
(ADOPTED JUNE 20, 1990)

8-49-100 GENERAL

8-49-101 **Description:** The purpose of this rule is to limit emissions of organic compounds from the use of hand-held aerosol paint products.

8-49-110 **Exemption, Non-Paint Aerosol Products:** The provisions of this rule shall not apply to aerosol lubricants, mold releases, asphaltic automotive underbody coatings, electrical coatings, cleaners, belt dressings, anti-static sprays, layout fluids and removers, adhesives, maskants, dyes or inks. (Adopted August 21, 1991)

8-49-111 **Exemption, Shipment and Use Outside District:** The provisions of this rule shall not apply to aerosol coatings sold, manufactured or warehoused in the District for shipment and use outside of the District. (Adopted August 21, 1991)

8-49-200 DEFINITIONS

8-49-201 **Aerosol:** A suspension of solid or liquid particles in a gas.

8-49-202 **Aerosol Paint Product:** A mixture of pigments, resins, liquid solvents and gaseous propellants, packaged in a disposable can for hand-held application.

8-49-203 **Organic Compound, Non-Precursor:** Methylene chloride, 1,1,1-trichloroethane, 1,1,2-trichlorotrifluoroethane (CFC-113), trichlorofluoromethane (CFC-11), dichlorodifluoromethane (CFC-12), dichlorotetrafluoroethane (CFC-114) chloropentafluoroethane (CFC-115), chlorodifluoromethane (HCFC-22), trifluoromethane (HFC-23), dichlorotrifluoroethane (HCFC-123), tetrafluoroethane (HFC-134a), dichlorofluoroethane (HCFC-141b), chlorodifluoroethane (HFC-142b), 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124), pentafluoroethane (HFC-125), 1,1,2,2-tetrafluoroethane (HFC-134), 1,1,1-trifluoroethane (HFC-143a), and 1,1-difluoroethane (HFC-152a). (Amended August 21, 1991)

8-49-204 **Organic Compound, Precursor:** Any compound of carbon, excluding methane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates and ammonium carbonate, excepting the non-precursor organic compounds listed in Section 8-49-203.

8-49-205 **Solids:** The non-volatile portion of an aerosol paint product, consisting of the film-forming ingredients (pigments and resins).

8-49-206 **Paint:** A mixture of pigments, resins, and liquid solvents which can be applied to a surface to form a thin and closely adherent coating. For the purposes of this regulation, this definition shall include but shall not be limited to clear coatings, primers, metallic coatings, and wood stains.

8-49-207 **Propellant:** A liquified or compressed gas which expels the contents of a container when the pressure is released.

8-49-208 **Art Varnish:** A coating labelled exclusively as such which provides a protective sealant for oil paintings or other closely related art uses. (Adopted August 21, 1991)

8-49-209 **Auto Body Primer:** A heavily pigmented automotive primer or primer surfacer coating labelled exclusively as such and applied directly to a an uncoated vehicle body substrate or on top of a precoat for purposes of corrosion resistance,

building a repair area to a condition in which it, after drying, can be sanded to a smooth surface. (Adopted August 21, 1991)

8-49-210 Automotive Bumper and Trim Products: Coatings formulated and labelled exclusively as such which are used to repair and refinish automotive bumpers and plastic trim parts including adhesion promoters and chip sealants. (Adopted August 21, 1991)

8-49-211 Aviation Propeller Coating: An epoxy coating formulated and labelled exclusively as such which provides abrasion resistance and corrosion protection for aircraft propellers. (Adopted August 21, 1991)

8-49-212 Aviation Zinc Primer: Zinc chromate or zinc oxide coatings formulated to military specification MIL-P-8989 and labelled exclusively as such. (Adopted 8/2191)

8-49-213 Clear Coating: A coating which is colorless, containing binders but no pigment, and which is formulated to form a transparent or translucent solid film. (Adopted August 21, 1991)

8-49-214 Corrosion Resistant Brass/Bronze/Copper Coating: A clear coating formulated and labelled exclusively as such to prevent tarnish and corrosion of brass, bronze and copper surfaces. (Adopted August 21, 1991)

8-49-215 Enamel: A coating which cures by chemical cross-linking of its base resin. Enamels can be readily distinguished from lacquers because enamels are not resoluble in their original solvent. (Adopted August 21, 1991)

8-49-216 Engine Paint: A coating, labelled exclusively as such, applied to the exterior surface of motor vehicle engine blocks or components attached to a motor vehicle engine. The cans shall be labelled with the Original Equipment Manufacturer's (O.E.M.) part number. (Adopted August 21, 1991)

8-49-217 Exact Match Finish, Automotive: A topcoat labelled exclusively as such, which is formulated to exactly match the color of the original, factory-applied automotive finish coating during touch-up or minor repair operations. The cans shall be labelled with the Original Equipment Manufacturer's (O.E.M.) part number. Can contents shall not exceed six ounces by weight if offered for retail sale. (Adopted August 21, 1991)

8-49-218 Exact Match Finish, Industrial: A coating which is formulated to exactly match the color of an original, factory-applied industrial coating. The cans shall be labeled with the manufacturer's name for which they were formulated, and with the Original Equipment Manufacturer's (O.E.M.) part number. This category applies primarily to touch-up of manufactured products prior to shipment or during initial installation; retail sales will be allowed through authorized O.E.M. dealers only. (Adopted August 21, 1991)

8-49-219 Flat Paint Products: A coating which, when fully dry, has a gloss of 5 or less on a 60^{o} meter. (Adopted August 21, 1991)

8-49-220 Floral Spray: A coating labelled exclusively as such, which is sprayed on fresh flowers for the purpose of preserving and protecting their appearance. (Adopted August 21, 1991)

8-49-221 Fluorescent Coating: A coating labelled as such which converts absorbed incident light energy into emitted light of a different hue. (Adopted August 21, 1991)

8-49-222 Glass Coating: A coating labelled exclusively as such, which is applied to glass to tint or darken the color of the glass while retaining transparency. (Adopted August 21,1991)

8-49-223 Ground Traffic/Marking Coating: A coating used to delineate vehicular or pedestrian traffic flow in a manufacturing facility or on a public highway, or to mark or define locations used by public utilities (e.g. gas, telephone, electric). (Adopted August 21, 1991)

8-49-224 **High Temperature Coating:** A coating labelled exclusively as such, which is formulated for and applied to substrates which will, in normal use, be subjected to temperatures in excess of 400°F. (Adopted August 21, 1991)

8-49-225 **Hobby/Model/Craft Coating:** A coating primarily for hobby applications. Can contents shall not exceed six ounces by weight. (Adopted August 21, 1991)

8-49-226 **Lacquer:** A thermoplastic film-forming material dissolved in organic solvent, which dries primarily by solvent evaporation, and hence is resoluble in its original solvent. (Adopted August 21, 1991)

8-49-227 **Marine Spar Varnish:** A coating labelled exclusively as such which provides a protective sealant for marine wood products. (Adopted August 21, 1991)

8-49-228 **Metallic Coating:** A topcoat containing metallic particles which impart a metallic appearance when dry. (Adopted August 21, 1991)

8-49-229 **Multi-Component Kits:** Aerosol spray paint systems which require the application of more than one component (e.g. foundation coat and top coat), where both components are sold together in one package and neither is sold separately. (Adopted August 21, 1991)

8-49-230 **Photographic Emulsion Coating:** A coating formulated and labelled exclusively as such, applied to finished photographs to allow corrective retouching or protection of the image. (Adopted August 21, 1991)

8-49-231 **Non-Flat Paint Products:** A coating which, when fully dry, has a gloss of greater than 5 on a 60° meter. (Adopted August 21, 1991)

8-49-232 **Primer:** A coating formulated and labelled as such to be applied to a surface to provide a bond between that surface and subsequent coats. (Adopted August 21,1991)

8-49-233 **Retail Sales:** The sale of goods directly to a non-commercial consumer. For the purposes of this Rule, sales to jobbers and industrial end-users shall not be deemed retail sales. (Adopted August 21, 1991)

8-49-234 **Shellac Sealer:** A clear or pigmented coating formulated solely with the resinous secretion of the lac beetle (Laccifer lecca), thinned with alcohol, and formulated to dry by evaporation without a chemical reaction. (Adopted August 21, 1991)

8-49-235 **Slip-Resistant Epoxy Coating:** An epoxy ester coating labelled exclusively as such which is formulated with synthetic grit, and used as a safety coating. (Adopted August 21, 1991)

8-49-236 **Spatter Coating:** A coating wherein spots, globules, or spatters of individual or contrasting colors appear on or within the surface of a contrasting or similar background. (Adopted August 21, 1991)

8-49-237 **Vinyl/Fabric/Polycarbonate:** A coating labelled exclusively as such, which is used exclusively to coat vinyl, fabric, or polycarbonate substrates. (Adopted August 21, 1991)

8-49-238 **Webbing/Veiling Coating:** A coating labelled exclusively as such, which is formulated to give a stranded or spider webbed appearance when applied. (Adopted August 21, 1991)

8-49-239 **Weld-Through Primer:** A coating formulated and labelled exclusively as such which provides a bridging or conducting effect to provide corrosion protection following welding. (Adopted August 21, 1991)

8-49-240 **Wood Stain:** A coating which is formulated to change the color of a wood surface but not conceal the surface. (Adopted August 21, 1991)

8-49-241 **Wood Touch-Up/Repair/Restoration:** A coating formulated and labelled exclusively as such which provides an exact color or sheen match on finished wood products. (Adopted August 21, 1991)

8-49-242 **Workable Art Fixative:** A clear coating formulated and labelled exclusively as such which provides protection for pencil, charcoal, chalk and pastel drawings, while providing a workable surface. (Adopted August 21, 1991)

8-49-243 **Volatile Organic Compound (VOC):** Any precursor or non-precursor organic compound which would be emitted during the use, application, curing or drying of an aerosol paint product. (Adopted August 21, 1991)

243.1 For the purposes of calculating the VOC content of an aerosol paint product, difluoroethane (HFC-152a) shall not be considered part of the aerosol paint product. (Adopted June 2, 1993)

8-49-300 **STANDARDS**

8-49-301 **Limits:** A person shall not sell, offer for sale, apply, solicit or manufacture for sale within the District any hand-held aerosol paint product with a VOC content in excess of the following limits, expressed as percent VOC by weight of product:

		VOC Limits (%)
301.1	General Coatings	
	Clear Coating	67
	Flat Paint Products	60
	Fluorescent	65
	Ground Traffic Marking Coating	66
	Metallic Coating	80
	Non-Flat Paint Products	65
	Primer 60	
301.2	Specialty Coatings	
301.2.1	Specialty Clear and Tinted Coatings	
	Corrosion Resistant Brass/Bronze/Copper Coating	92
	Photographic Emulsion Coating	95
	Art Varnish	92
	Marine Spar Varnish	92
	Vinyl/Fabric/Polycarbonate	95
	Webbing/Veiling Coating	95
	Wood Stain	95
	Workable Art Fixative	95
301.2.2	Exact Match Finish	
	Engine Enamel	80
	Automotive	88
	Industrial	88
301.2.3	Miscellaneous Coatings	
	Auto Body Primer	80
	High Temperature Coating	80
	Hobby/Model/Craft Coatings	
	Enamel	80
	Lacquer	88
	Clear, Metallic	95
	Shellac Sealer	
	Clear	88
	Pigmented	75
	Spatter Coating	80

301.3	Non-Retail Specialty Coatings	—
	Automotive Bumper and Trim Products	95
	Aviation Propeller Coating	84
	Aviation Zinc Primer	82
	Floral Spray	95
	Glass Coating	95
	Slip-Resistant Epoxy Coating	85
	Weld-Through Primer	75
	Wood Touch-up/Repair/Restoration	95

(Amended August 21, 1991)

8-49-302 Prohibition of Non-Intended Use: A person shall not use within the District any coating subject to the standards of Section 8-49-301 for any use other than that shown on the product label. (Adopted August 21, 1991)

8-49-303 Multi-Component Applications: A person shall not sell, offer for sale, apply, solicit or manufacture for sale within the District any multi-component aerosol kit as defined in Section 8-49-229 unless the total VOC emitted from the use of that multi-component kit does not exceed the VOC which would be allowed from a single-component product in the same specialty category listed in Section 8-49-301. (Adopted August 21, 1991)

8-49-304 Prohibition of Retail Sale: If any coating subject to the VOC limitations of Section 8-49-301.3, Non-Retail Specialty Coatings is offered for retail sale to the general public, that coating shall be subject to the VOC standards in Section 8-49-301.1, General Coatings. Retail sale of exact match industrial coatings will be allowed through authorized Original Equipment Manufacturer (O.E.M.) dealers only. (Adopted August 21, 1991)

8-49-305 Interim Limit: Until July 1, 1992 any product which has been reformulated to meet the 2.0 grams VOC/grams solid limit (67%) in effect June 20, 1990 shall be legal for manufacture, sale and use within the District, provided the requirements of Section 8-49-403 are met. (Adopted August 21, 1991)

8-49-400 ADMINISTRATIVE REQUIREMENTS

8-49-401 Labeling Requirements: Each container of any aerosol paint product subject to this rule manufactured for sale, sold or offered for sale within the District shall be permanently and exclusively labeled (e.g. "for automotive use only") by coating type and shall display the maximum organic compound content expressed as % VOC as determined under Section 8-49-601. (Amended August 21, 1991)

8-49-402 Duplicate Specification Standards: If anywhere on the container of any aerosol paint product listed in section 8-49-301, or on any sticker or label affixed thereto, or in any sales or advertising literature, any representation is made that the product may be used as, or is suitable for use as a product for which a lower VOC standard is specified, then the lowest applicable VOC standard shall apply. (Adopted August 21, 1991)

8-49-403 Reformulated Product Petitioning Requirement: Any person seeking to meet the interim limit pursuant to Section 8-49-305 shall petition the APCO in writing. The petition shall contain the following information:

403.1 Date of product reformulation

403.2 VOC of product prior to reformulation

403.3 Average monthly sales data of product in the Bay Area immediately prior to and subsequent to reformulation

403.4 Earliest expected date of reformulation to current VOC standards

(Adopted August 21, 1991)

8-49-500 MONITORING AND RECORDS

8-49-501 Recordkeeping Requirements: Each person who manufactures hand-held aerosol paint products for sale in the District shall maintain sales data by category and organic compound content expressed as % VOC by weight. These data shall be submitted to the APCO every three months. The first sales data shall be due October 31, 1991; subsequent reports shall be due at three month intervals.

(Amended August 21, 1991)

8-49-600 MANUAL OF PROCEDURES

8-49-601 Determination of Compliance, Hand-Held Aerosol Paint Products: The means by which compliance of hand-held aerosol paint products is determined are found in the Manual of Procedures, Volume III, Method 35 and 36.

(Amended August 21, 1991)

Volume II: Architectural Coatings

The statements and conclusions in this report are those of the contractor and not necessarily those of the California Air Resources Board. The mention of commercial products, their sources, or their use in connection with material reported herein is not to be construed as actual or implied endorsement of such products.

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Technical direction was provided by Dr. Julie Billington and Ms. Peggy Taricco of ARB's Stationary Source Division. The Contract Manager was Mr. Ralph Propper of ARB's Research Division.

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ABSTRACT

The California Air Resources Board (ARB) is authorized under the California Health and Safety Code and Title 17 to require submission of information needed to estimate atmospheric emissions and to carry out its statutory responsibilities. In 1993, the ARB conducted surveys of sales in California for both aerosol paints and architectural coatings. Battelle processed the survey data and prepared a computer database, reviewed the data for accuracy and completeness, contacted representatives of participating companies to resolve problems, and summarized the results. The results will help the ARB understand the marketplace for these source categories, and evaluate the emissions and cost impacts of proposed emission control measures.

Battelle analyzed data from ARB's fourth survey of companies that sold architectural and industrial maintenance coatings (for the year 1990). The 174 companies that responded reported California sales of 77 million gallons, with VOC emissions estimated at 39,100 tons per year. The 25 largest companies were responsible for most of the sales. Sales were reported in 33 coating categories, and distributions were provided based on VOC content. Close to half the sales were in the flat paint category, and water-borne coatings constituted about three-quarters of all sales. However, solvent-borne VOC emissions were more than twice those from water-borne coatings. Acrylic and vinyl resins were used mainly for water-borne coatings, while alkyd resins were used mainly for solvent-borne coatings.

Battelle attempted to calculate the potential emission reductions that may result from full implementation of the "Suggested Control Measure" (SCM) developed by ARB and CAPCOA in 1989. The calculations were complicated by the fact that the manufacturers of some coatings recommend thinning with solvent before application. Depending upon the calculation method chosen, roughly 20 to 30 percent of the emissions from solvent-borne coatings may be eliminated by implementation of the SCM.

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INTRODUCTION

This report presents statistical results from a survey, conducted by the California Air Resources Board (ARB), of architectural coatings manufacturers and distributors who sold Architectural and Industrial Maintenance (AIM) coatings in California in 1990. This is the fourth such survey conducted since 1980 to collect data on the composition and sales of architectural coatings sold in the State for the purpose of estimating atmospheric emissions from these products.

These surveys have been undertaken to help the ARB and local air quality management and air pollution control district staff track the volatile organic compound (VOC) emissions from architectural coatings, and also to provide information to assist in the development and implementation of regulations to reduce the VOC emissions from architectural coatings. Architectural coatings have been regulated in California since the late 1970s. In 1977 the ARB approved a model rule which formed the basis for many district regulations over the ensuing years. This model rule was revised in 1985 and again in 1989, at which time the rule was referred to as a "suggested control measure." This report, in addition to providing information on the sales and emissions of coatings sold in the State during 1990, also contains estimates of the potential emission reductions that may be achieved under the 1989 ARB-CAPCOA Suggested Control Measure For Architectural Coatings.

MATERIALS AND METHODS

THE SURVEY

In February, 1993, the ARB mailed survey questionnaires to companies that potentially sold architectural coating products in California during 1990. The mailing list has been expanding since the initial survey was conducted by ARB in 1980. Original sources for the mailing list include the Golden Gate Society for Coatings Technology, Golden Gate Paint and Coating Association, Southern California Paint and Coatings Association, Los Angeles Society for Coating Technology, South Coast Air Quality Management District, and the National Paints and Coatings Association. Companies are also added to the mailing list when they contact ARB for information about regulations, or are identified in the course of ARB's regulation development efforts.

The ARB received 179 completed questionnaires as of May 1, 1994. However, this number was reduced to 174 after consolidating duplicate information and eliminating companies that did not sell coatings in California. The number of companies responding to the 1988 survey conducted by the ARB was 130, ten fewer than the number responding in 1984. Table 1a contains the names of 66 participating companies with headquarters in California (based on reported mailing address), and Table 1b lists the names of 108 participating companies located in other U.S. states. Seventy-six companies were identified as small businesses, with annual sales of less than $5 million and fewer than 100 employees.

Information requested from the companies included company address, contact person, company size (annual sales and number of employees), and marketing classification (interstate, statewide, regional). Product information requested includes coating category, sales (large and small containers), type of application (interior/exterior, general/special substrate), product composition (carrier technology, resins used, percent solids, and VOC content). A copy of the survey questionnaire mailed to the companies is provided in Appendix B.

1990 ARB AIM Coating Survey

Table 1a. California Based Companies Reporting 1990 Sales of Architectural and Industrial Maintenance Coatings

AC Products, Inc.
Ameritone Paint Corporation
Ameron PCD
Behr Process Corporation
Benjamin Moore & Company
Bithell, Inc. / Virtrochem
Cal Western Paints, Inc.
Contract Coatings Corporation
Corchem Corporation
D. J. Simpson Company, Inc. DBA Simpson Coatings Group, Inc.
Davis Colors
Davlin Paint Company
Decratrend Paints
Deft, Inc.
Devoe Coatings Co.
Duckback Products, Inc.
Dunn-Edwards Corporation
Early American Paint & Varnish Company
Ellis Paint Co.
Epmar Corporation
Epoxylite Corporation
Evr-Gard Coatings
Fine Line Paint Corp.
Flamort Chemical Company
Frazee Industries, Inc.
Flecto Company, Inc.
Fuller - O'Brien Paints (The O'Brien Corporation)
Guardsman Products, Inc., Coatings Group
Henry Company
Hill Brothers Chemical Company
Hoffmann Paint Manufacturing Company
J. S. Williams & Sons
Kelly-Moore Paint Company, Inc.
L. M. Scofield Company
Lahabra Products, Inc.
Life Paint Company
Lyle Van Patten Company, Inc.
Major Paint Company
Morton International, Inc.
Norton & Son of California, Inc.
Old Quaker Paint Company
Parks Corporation
Performance Coatings, Inc.
Pervo Paint Company
Pierce & Stevens Corporation
Pioneer Coatings Co.
Ponderosa Paint Co.
Preserva-Products, Inc.
Pride Paint Company
R. J. McGlennon Company, Inc.
Samuel Cabot, Inc.
San Luis Paints
Scotch Paint Corp.
Sinclair Paint Company / Division of Insilco Corp.
Smiland Paint Company
Southwest Division, Witco Corporation
Spectra-Tone Paint
Surface Protection Industries, Inc.
T. J. Westlund, Inc., DBA Humboldt Paint Factory
Textured Coatings of America
Tresco Paint Company, Inc.
Triangle Coatings
U.S. Cellulose Co., Inc.
Universal Paint Corp.
W. R. Meadows of California, Inc.
Western Colloid Products

1990 ARB AIM Coating Survey

Table 1b. Non-California Based Companies Reporting 1990 Sales of Architectural and Industrial Maintenance Coatings

3M
Absolute Coatings, Inc.
Akzo Coatings, Inc. - Georgia
Akzo Coatings, Inc. - Michigan
Alfa Ink Division
American Safety Technologies, Inc.
Automotive Finishes, Inc.
Briner Paint Manufacturing Co., Inc.
California Products Corporation
Carbolineum Wood Perserving Co.
Champion Coatings
Chase Products Company
Childers Products Company
Coatings for Industry, Inc.
Consumers Paint Factory, Inc.
Continental Products Company
CRC Industries, Inc.
Crescent Bronze Powder Company, Inc.
Daly's, Inc.
Dampney Company, Inc.
DAP, Inc.
Darworth Company
Dexter Packaging Products Division
Dyco Paints, Inc.
Dymatron / Bondo Corporation
E.S.P., Inc.
Enerfab Corporation
Enclid Chemical Company
Fields Corporation / American Tar Company
Flame Control Coatings, Inc.
Frost Paint & Oil Corporation
Gaco Western, Inc.
Gardner Asphalt Corp.
GC Electronics
Gibson-Homans Company
Glidden Company
Gulf Coast Paint Manufacturing, Inc.
Harco Chemical Coatings, Inc.
Hartin Paint & Filler Corp.
Hempel Coatings (USA), Inc.
Huntington Laboratories, Inc.
Hydrozo, Inc.
Imperial Paint Company, Inc.
Industrial Epoxy Coatings, Inc.
Iowa Paint Mfg. Co., Inc.
ITW Philadelphia Resins
James B. Day & Company
Jones Blair Company
Keeler & Long, Inc.
Klinger Paint Company, Inc.
Kool Seal, Inc.
Lilly Industries, Inc. - Perfection Paint Division
Mameco International, Inc.
Maquet Paint/McGrevor Coatings
Matthews Paint Company
Minwax Company, Inc.
Multi-Clean Division of Hako Minuteman
National Polymers, Inc.
National Varnish Company
Okon, Inc.
Porter International (Division of Courtalds Coatings, USA)
PPG Architectural Finishes, Inc.
Pratt & Lambert, Inc.
Proko Industries, Inc.
Rainbow Coatings Corporation
Republic Powdered Metals, Inc.
Rich Art Color Co., Inc.
Robinson Chemical Coatings, Inc.
Rudd Company, Inc.
Rust-Oleum Corporation
Schulte Paint Manufacturing Company, Inc.
Seagrave Coatings Corporation of Virginia, Seaguard Division
Sheboygan Paint Company
Sherwin-Williams Company
Sigma Coatings
Somay Products, Inc.
Southwestern Petroleum Corporation
Standard T Chemical
Star Bronze Company, Inc.
Steelcote Manufacturing Company
Sumark - Natasco C/O MPV Company
Sunnyside Corporation
Tapecoat Company
Tenax Finishing Products Company
Texas Refinery Corporation
Thompson & Formby, Inc.
Thoro System Products
Thernec Company, Inc.
Torginol, Inc. (Previously Peterson Chemical Corporation)
Tru-Test Manufacturing Company
United Gilsonite Laboratories
United Coatings, Inc.
United Paint Manufacturing Company, DBA United Coatings
Valspar Corporation (Consumer Division)
Valspar Corporation (Federal International Chem. Div.)
Valspar Corporation (Maintenance and Marine Division)
Valspar Corporation (McCloskey Division)
Vanex, Inc.
W.R. Grace & Co. - Conn
Waterlox Chemical & Coatings Corporation
Wellborn - De Corporation
Westinghouse - Electrical Materials Division
William Zinsser & Company, Inc.
Wiltech Corporation
Wood-Kote Products
Xim Products, Inc.
Zehrung Corporation
ZRC Products Company

DATA PROCESSING

Battelle Memorial Institute, under contract with the ARB, processed the survey data. As the surveys were received, the ARB did preliminary checks of the surveys and contacted by telephone all the respondents with obvious mistakes in their calculations, or obvious deficiencies or misunderstandings. ARB then discussed with Battelle how to electronically check the data using known relationships between the requested values. Battelle programmed these relationships into the computer and generated tables of line items that did not conform to these relationships. After further discussions, Battelle called the respondents to resolve the inconsistencies that could not otherwise be resolved. Most of the companies that responded to the survey were contacted either by ARB or by Battelle to resolve all of the data issues.

Several steps were taken to ensure the accuracy and completeness of the data:

- Data were keyed twice into separate Paradox data files by two different keyers. The resulting files were compared electronically and differences were resolved using the original data forms.

- Data were sorted and printed for visual inspection to identify missing data and obvious errors in completing the questionnaires.

- Electronic data checks were performed to identify problems with the data. These checks included verifying that (1) No critical data fields were missing (e.g., total sales, VOC content), (2) VOC range code agreed with reported VOC content, (3) VOC content of material agreed with VOC content at maximum thinning, and VOC regulatory (less water, less exempt) was greater than VOC content of material for all water-borne products, and (4) Certain relationships existed among reported VOC content parameters (material, maximum thinning, and regulatory) for all solvent-borne products.

- Most of the problems identified through visual inspection and electronic data checks were resolved by contacting company representatives. Approximately 85 companies were contacted by the ARB or Battelle. Most of the problems were easily resolved by correcting illegible data or recalculating values after discovering that the instructions were misunderstood.

The data presented in this report were provided to the ARB by participating companies who manufacture or distribute architectural and industrial maintenance coatings in California. In processing the data, Battelle made every effort to minimize errors in data entry and took several steps to identify inconsistencies in the data. Battelle and ARB attempted to resolve problems by contacting company representatives. The validity of the results presented in this report depends on the accuracy of the data which were provided by coating manufacturers and distributors.